

# ABSTRACT

Single layer anti-reflective hard-coat; in particular which comprises a structured surface, preferably a nano-structured surface. The hard-coat preferably a  
5 hardness above 0.5 GPa, more preferably above 0.7 GPa and most preferably above 1.0 GPa as measured by nano-indentation and/or a reduced tensile modulus above 3 GPa, more preferably above 8.5 GPa or 20 GPa, most preferably above 40 GPa as measured by nano-indentation and/or a scratch resistance above  $5 \text{ mJ } \mu\text{m}^{-3}$ , preferably above 15 or  $30 \text{ mJ } \mu\text{m}^{-3}$ , preferably above  $60 \text{ mJ } \mu\text{m}^{-3}$  as measured by nano-  
10 indentation, and/or contains an amount of inorganic nano-particles from 5 to 75 weight %, preferably from 15 to 50 weight % relative to the weight of the second material present in the hard-coat.

Preferably, the spatial length scale of the refractive index gradient in the single layer hard-coat is between 10 and 1000 nm; in particular between 100 and  
15 200 nm.

Also concerned is a process for preparing a single layer hard-coat, comprising the steps of

- a) applying a mixture on a substrate, which mixture comprises
  - 20 i. at least a first material which does not crosslink under the conditions chosen in step b)
  - ii. at least a second material which does crosslink under the conditions chosen in step b)
  - iii. nano-particles, and
  - iv. optionally at least one solvent
- 25 b) inducing crosslinking in the mixture applied to the substrate,
  - v. subsequently removing at least part of the first material, and shaped articles comprising such single layer hard-coat.